PATENT
Docket No. GC637-2
SN 09/975,139

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FAX COVER SHEET

TO: Art Unit 1631

LOCATION: USPTO

Fax No.: 703-872-9306 (Before Final Facsimile No.)

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FROM: Carol See for Kamrin T. MacKnight
Patent Attorney

LOCATION: GENENCOR INTERNATIONAL, INC.
Legal Department
925 Page Mill Road
Palo Alto, CA 94304-1013
Tel: 650-846-5838
Fax: 650-845-6504

DATE: November 3, 2003

NUMBER OF PAGES TO FOLLOW: 8 SENT BY: cas

Re: USSN 09/975,139; Docket No. GC637-2

Attachments: Transmittal Letter (1 page) in duplicate, and Response to Restriction Requirement (6 pages).

The original of this facsimile will be sent to you via:

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Date: November 3, 2003 By: Carol A. See
Carol A. See

PATENT
Docket No. GC637-2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	
Volker Schellenberger *et al.*	Group Art Unit: 1631
Serial No.: 09/975,139	Examiner: Mahatan, Channing
Filed: October 10, 2001	
For: Information Rich Libraries	

TRANSMITTAL LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Restriction Requirement dated October 2, 2003, enclosed please find the following document: Response to Restriction Requirement.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16 and 1.17 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 07-1048 (Docket No. GC637-2). A duplicate of this paper is enclosed.

Respectfully submitted,

Date: November 3, 2003

Kamrin T. MacKnight
Registration No. 38,230

Genencor International, Inc.
925 Page Mill Road
Palo Alto, CA 94304-1013
T l: 650-846-5838
Fax: 650-845-6504

I hereby certify that this correspondence is being sent by facsimile transmission in accordance with § 1.6(d) addressed to Art Unit 1631, Before Final Facsimile No. (703) 872-9306, Commissioner for Patents, Alexandria, VA 22313-1450 on the date shown below.

Date: November 3, 2003 By: Carol A. See

PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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For: Information Rich Libraries)
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Response to Restriction Requirement Mailed October 2, 2003

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Restriction Requirement mailed October 2, 2003, Applicants respectfully request that the following amendments be made. A complete list of the Claims, including marked-up versions of the rewritten, added, withdrawn, and/or cancelled claims is provided below, beginning on page 2. None of the amendments to the Claims is intended to narrow the scope of any of the amended Claims within the meaning of *Festo*[1]. The Remarks begin on page 6.

[1] *Festo Corp. v. Shoketsu Kogyo Kabushiki Co.*, No. 95-1066, 2000 WL 1753646 (Fed. Cir. Nov. 29, 2000).

LIST OF CLAIMS, SHOWING THE STATUS OF EACH CLAIM

Underlining denotes added text while strikethrough denotes deleted text.

IN THE CLAIMS:

1. (Original) A method of creating a library of DNA sequences, said method comprising:

a) providing a DNA sequence that encodes a protein of interest;

b) providing a probability matrix for the protein;

c) providing a constraint vector for the protein;

d) applying the constraint vector to the probability matrix to produce a substitution scheme recommending substitutions at at least two residues in the protein; and

e) creating a library of DNA sequences incorporating changes in the DNA sequence that produce the recommended substitutions.

2. (Original) The method of claim 1, wherein said protein is selected from the group consisting of an esterase, dehydrogenase and hydrolase.

3. (Original) The method of claim 2, wherein said protein is selected from the group consisting of a protease, cellulase, lipase, hemicellulase, laccase, and amylase.

4. (Original) The method of claim 1, wherein said protein is selected from the group consisting of a transcription factor, growth factor, antibody, interleukin, antigen, and receptor.

5. (Original) The method of claim 1, wherein the probability matrix is based on structural characteristics selected from the group consisting of conservative residues, sequence alignments, three dim nsional structure, residue environment, solvent accessibility, residue chemistry, propensity for a particular secondary structure, and combinations thereof.

6. (Original) The method of claim 1, wherein the constraint vector is based on structural characteristics known to affect protein function selected from the group consisting of proximity to the site of functionality, distance of α or β carbons, contact with residues of interest, and contact with residues that contact the residue of interest.

7. (Original) The library of claim 1, wherein said library is a phage library.

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. A system for creating libraries of nucleic acid sequences that encode variants of a protein, said system comprising:

a) an initial nucleic acid sequence that encodes a desired protein;

b) a probability matrix; and

c) a constraint vector.

12. (Cancelled)

13. (Cancelled)

14. (Original) The method of claim 1, wherein a library comprising at least 25 unique DNA sequences is produced.

15. (Original) The method of claim 14, wherein a library comprising at least 100 unique DNA sequences is produced.

16. (Original) The method of claim 15, wherein a library comprising at least 250 unique DNA sequences is produced.

17. (Original) The method of claim 16, wherein a library comprising at least 1000 unique DNA sequences is produced.

18. (Original) The method of claim 17, wherein a library comprising at least 2500 unique DNA sequences is produced.

19. (Original) The method of claim 18, wherein a library comprising at least 10,000 unique DNA sequences is produced.

20. (Original) The method of claim 1, wherein a library of less than 10^9 unique DNA sequences is produced.

21. (Original) The method of claim 20, wherein a library of less than 10^6 unique DNA sequences is produced.

22. (Original) The method of claim 21, wherein a library of less than 10^5 unique DNA sequences is produced

23. (Original) The method of claim 1, wherein the probability matrix is an algorithm.

24. (Original) The method of claim 1, wherein the probability matrix is generated by a computer.

25. (Original) The method of claim 1, wherein the constraint vector is an algorithm.

26. (Original) The method of claim 1, wherein the constraint vector is generated by a computer.

27. (Original) The method of claim 1, wherein the constraint vector is applied to the probability matrix using a computer.

28. (Original) The method of claim 1, wherein the probability matrix is

normalized.

29. (Original) The method of claim 1, wherein the DNA sequence is generated from DNA shuffling.

30. (Cancelled)

31. (Original) A method of creating a library of DNA sequences, said method comprising:

a) providing a substitution scheme produced by applying a constraint vector to a probability matrix wherein the substitution scheme recommends substitutions at at least two residues in a protein of interest; and

b) creating a library of DNA sequences incorporating substitutions in a DNA sequence encoding the protein of interest to create a library comprising the recommended substitutions.

REMARKS

The present application was originally filed with 31 Claims. In the present Restriction Requirement, the Examiner has restricted the Claims into five Groups:

I) Group I contains Claims 1-6, 11, 14-29, and 31, directed to methods and systems for creating libraries of nucleic acid sequences;

2) Group II contains Claim 7, directed to a library;

3) Group III contains Claims 8, 9, and 30, directed to methods for screening libraries for a protein with an increase in a property of interest;

4) Group IV contains Claim 10, directed to a protein; and

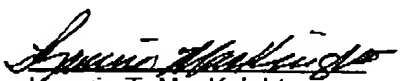
5) Group V contains Claims 12 and 13, directed to methods for improving a desired parameter of a protein of interest.

The Examiner argues that the Groups represent separate and patentably distinct inventions. While Applicants must respectfully traverse the restriction requirement, Applicants hereby elects the Claims in Group I (Claims 1-6, 11, 14-29, and 31), directed to methods and systems for creating libraries of nucleic acid sequences. Claims 8-10, 12, 13 and 30 have been cancelled. As Claim 7 (Group II) is a product-by-process Claim that is dependent upon Claim 1, Applicants respectfully request that this Group be joined with Group I. As Claim 7 is directed toward a particular type of library (*i.e.*, a phage library), Applicants submit that this is merely one type of library that is encompassed by Claim 1. Thus, there is no undue search burden to search Claims 1-7, 11, 14-29, and 31 together.

Applicants reserve the right to file Divisional application(s) to pursue the Claims cancelled herein. Should the Examiner have any questions regarding this application, she is encouraged to call the undersigned.

Respectfully submitted,

Date: November 3, 2003



Kamrin T. MacKnight
Registration No. 38,230

Genencor International, Inc.
925 Page Mill Road
Palo Alto, CA 94304-1013
Tel: 650 846-5838
Fax: 650 845-6504